What is claimed is:

1. An ALD process for deposition of a metal selected from Pd, Rh, Ru, Pt and Ir comprising forming a layer comprising the metal on a surface comprising a material selected from W, Ta, Cu, Ni, Co, Fe, Mn, Cr, V Nb, tungsten nitride, tantalum nitride, titanium nitride, dielectrics and activated dielectrics at a temperature ranging from >60°C to <260°C.

2. An ALD process according to claim 1, wherein forming a layer comprises sequentially pulsing into a chamber containing the surface a precursor for the metal and a reducing gas selected from hydrogen, glyoxylic acid, oxalic acid, formaldehyde, 2-propanol, imidazole and plasma-activated hydrogen.

3. An ALD process for deposition of a metal selected from Pd, Rh, Ru, Pt and Ir comprising

providing a surface comprising a material selected from noble metals, W, Ta, TaN, tungsten nitride, tantalum nitride, titanium nitride, Cu, Ni, Co, Fe, Mn, Cr, V and Nb in a reaction chamber;

pulsing a precursor for the metal into the chamber at a temperature ranging from >60°C to <260°C; and

pulsing hydrogen gas into the chamber.

4. An ALD process according to claim 3 wherein the surface is a noble metal.

5. An ALD process according to claim 3 wherein the surface is a pretreated metallic surface selected from W, Ta, tungsten nitride, tantalum nitride, and titanium nitride.

6. An ALD process according to claim 3 wherein the surface is a metal selected from Cu, Ni, Co, Fe, Mn, Cr, V and Nb.

7. An ALD process for deposition of a metal selected from Pd, Rh, Ru, Pt and Ir comprising

providing a surface comprising a material selected from noble metals, W, Ta, Cu, Ni, Co, Fe, Mn, Cr, V Nb, tungsten nitride, tantalum nitride, titanium nitride, dielectrics and activated dielectrics in a reaction chamber at a temperature ranging from >60°C to <260°C;

pulsing a precursor for the metal into the chamber; and

pulsing into the chamber a reducing gas selected from glyoxylic acid, oxalic acid, formaldehyde, 2-propanol, and imidazole.

8. An ALD process according to claim 7 wherein the reducing gas is glyoxylic acid.

9. An ALD process according to claim 7 or 8 wherein the activated dielectric surface comprises at least one of thiol, sulfide, tetrasulfide, phosphine, phosphide or amine groups.

10. An ALD process according to claim 7 or 8 wherein the activated dielectric surface comprises thiol groups.

11. An ALD process according to claim 7, 8 or 9 wherein the dielectric is selected from CVD polymers, organic-inorganic hybrids, and silicon or metals having an oxide-terminated surface.

12. An ALD process for deposition of a metal selected from Pd, Rh, Ru, Pt and Ir comprising

providing a substrate in a reaction chamber;

pulsing a precursor for the metal into the chamber at a temperature ranging from >60°C to <260°C; and

pulsing plasma-activated hydrogen gas into the chamber.

13. An ALD process according to any of the above claims, wherein the precursor is a metal β-diketonate compound.

14. An ALD process according to any of the above claims, wherein the precursor is a metal-hfac compound.

15. An ALD process according to claims 1-12, wherein the precursor is selected from $Pd(hfac)_2$, $Ru(hfac)_2$, $Rh(hfac)_2$, $Pt(hfac)_2$, $Ir(hfac)_2$, $Ir(acac)_2$, $Pd(tmhd)_2$, $Ru(tmhd)_2$, $Rh(tmhd)_2$, $Pt(tmhd)_2$, and $Ir(tmhd)_2$.

16. An ALD process according to any of the above claims, wherein the metal is Pd.

17. An ALD process according to any of the above claims, wherein the precursor is $Pd(hfac)_2$.